4

4.0 Recommendations

4.1 Future-Conditions Hydrology

The Council recommends that FEMA support and encourage the use of future land-use conditions in determining the hydrology for floodplain delineations.

Flood Insurance Studies (FISs) and Flood Insurance Rate Maps (FIRMs) currently depict the 100-year (1%-annual-chance) and 500-year (0.2%-annual-chance) floodplains based on existing development conditions in the watersheds. It is well known that urbanization of watersheds can dramatically change the hydrologic regime, including an increase in flood discharges. Many communities experiencing or anticipating significant growth have defined 100-year floodplains based on future growth projections in their watersheds; these communities would like to show these future 100-year floodplains on their FIRMs.

The Council recommends that 100-year future-conditions flood profiles and floodplain delineations be included in future FISs and in the digital FIRM database at the option of the local community for use in planning and floodplain management. DFIRM products will accommodate different thematic layers for each floodplain. For the paper maps, the Council recognizes it may not be possible for all three floodplains to be distinguishable at the FIRM scale. When the 500-year and the 100-year future-conditions floodplains are so close together as to be confusing when both are shown, it is recommended that only the 100-year future-conditions floodplain be shown on the paper maps with appropriate reference to the 500-year information in the FIS and in the DFIRM database.

See Section 3.1 for further discussion of this issue.

4.2 Unnumbered A-Zones (No Base Flood Elevations)

FEMA should strive to improve or eliminate all Unnumbered A-Zones without base flood elevation (BFE) data.

FEMA should investigate the approaches for improving Unnumbered A-Zone delineations and data outlined in Section 3.2 of this report. When determining the scope of a new or revised FIS, FEMA should evaluate the adequacy of any identified Unnumbered A-Zone information for the area. FEMA should discourage the practice of delineating Unnumbered A-Zones. FEMA should develop, adopt, and enforce minimum technical criteria for mapping Unnumbered A-Zones

consistent with Federal Geographic Data Committee (FGDC) procedures for developing and promulgating standards.

See Section 3.2 for further discussion of this issue.

4.3 Alluvial Fans

***The Council endorses FEMA's formal adoption of its July 17, 1999 publication entitled:* Guidelines for Determining Flood Hazards on Alluvial Fans.**

This report clarifies the current understanding of alluvial fans and methodologies to map them. Use of the *Guidelines* in preparing floodplain studies for alluvial fans will address three of the Council's concerns about alluvial fans: consistent definition of alluvial fan flooding, incorporation of geological and geomorphological analyses into the mapping of alluvial fan floodplains, and the development of technical guidelines and criteria for computer modeling of alluvial fan floodplains. The Council makes the following recommendations to quickly and efficiently implement the new *Guidelines.*

1. **Encourage formal adoption of the *Guidelines* by states, local governments and professionals who map alluvial fans.** The Council recommends that FEMA encourage states and local governments whose jurisdiction includes areas subject to alluvial fan flooding and associations of professionals who map alluvial fans (engineers, geologists, geomorphologists, hydrologists) to formally adopt and implement these *Guidelines* to assure consistency in technical terminology and in mapping techniques.
2. **Relate the maps to regulations and to insurance requirements.** The Council recommends that FEMA continue discussions and meetings with state and local governments in order to develop floodplain regulations and flood insurance requirements that relate clearly and logically to the floodplain maps for alluvial fans.
3. **Initiate a cooperative public information and education program.** The Council further recommends that state and local governments, and professional associations and organizations initiate, in cooperation with FEMA and other federal agencies, an ongoing program to make all affected groups aware of the changes in FEMA's approach to mapping alluvial fan floodplains. FEMA should solicit cooperation from these parties in developing regulatory and insurance approaches and in continuing to improve mapping techniques and mitigation alternatives.

See Section 3.3 for further discussion of this issue.

4.4 Multiple Hazards Affecting Flood Risks

The Council recommends that multiple hazards that pose flood risks that can cause loss of life and property be included in DFIRM products. The Council further recommends that FEMA continue participation in the Open GIS Consortium to provide links to other sites containing hazard data affecting flood risks for retrieval by users.

Events that are typically not shown on FIRMs but pose a significant risk include: tsunamis; flooding downstream of a dam, either through normal operation or a sudden failure; debris flows; earthquake induced flooding; severe river-bank erosion and migration; and flooding due to increased run-off subsequent to wildfires.

See Section 3.4 for further discussion of this issue.

4.5 Distribution of Data: Archiving, Map Availability, and Accuracy

The Council recommends that FEMA set up a retrieval system for archived data both in its possession and housed elsewhere, including an index for location of historic FIRMs, LOMCs, and technical back-up data for flood studies.

FEMA need not maintain the data itself, but should know where it is and be able to access and retrieve it for other flood data users.

See Section 3.5 for further discussion of this issue.